VIEWS
Visibility Information Exchange Web System

VIEWS Update - April 2003

http://vista.cira.colostate.edu/views

What is VIEWS?

The **V**isibility **I**nformation **E**xchange **W**eb **S**ystem is an online system designed to acquire, manage, and provide access to data and metadata related to visibility and air quality, and to support the efforts of the five Regional Planning Organizations (RPOs) to meet the requirements of the Environmental Protection Agency's Regional Haze Rule to reduce regional haze in national parks and wilderness areas.

Administrative Information:

Sponsor:	Five Regional Planning Organizations (RPOs) (WRAP, CENRAP, MidwestRPO, VISTAS, MANE-VU)
Guiding Body:	VIEWS Steering Committee
Project Liaison:	Dr. Bret Schichtel, National Park Service
Development:	Cooperative Institute for Research in the Atmosphere (CIRA), (Colorado State University)
Location:	CSU Foothills Campus, Fort Collins, CO
Other Affiliations:	Interagency Monitoring Of Protected Visual Environments (IMPROVE)

Overall Goals:

Bring diverse data sets together so users can access them and analyze them in a common environment and with a common set of tools

Facilitate RPO support of the Regional Haze Rule

Facilitate visibility and air quality research in general

Major Components:

Integrated Database

Query and Analysis Tools

Resource Catalogs

User Collaboration

Initial Scope of VIEWS:

- Transform the WRAP website into the VIEWS website
  - Design a new "look and feel"
  - Leverage existing content and tools
  - Upgrade the software and hardware infrastructure
- Provide an online version of the Annual IMPROVE Data Summary
  - Spatial and seasonal analyses
  - Aerosol and light extinction budgets
  - Air mass histories – back trajectories
  - Best/worst 20% visibility days and other aggregations
- Expand the existing data inventory
  - Add IMPROVE, IMPROVE Protocol, and CASTNet data from non-WRAP states
  - Acquire EPA AIRS PM 2.5 and speciated fine aerosol data
  - Add RPO-specific data sets and other data as prioritized by CIRA and RPOs
- Provide enhanced data access and analysis tools
  - Improve the interface and performance of the database query wizard
  - Expand the available metadata output options
  - Provide additional formatting and output options for query results

Current Status - March 2003:

- Transform the WRAP website into VIEWS website
  - First version came online in September, 2002
  - Interface and performance enhancements are ongoing
- Provide an online version of the Annual IMPROVE Data Summary
  - Partial version made available in December, 2002 (only back trajectories)
  - First full version delivered in February, 2003
  - Performance and interface improvements released March, 2003
- Expand the existing data inventory
  - Existing networks have been expanded with additional available data
  - Additional networks were added in November and December, 2002
  - Additional data and metadata is currently being collected and integrated
- Provide enhanced data access and analysis tools
  - New Database Query Wizard made available in December, 2002
  - Performance and interface enhancements released in January, 2003

Technical Notes:

- Major Components
  - Website and associated online tools
  - Integrated Database and data ingest procedures
  - Raw data files and support documents (SOPs, White Papers, Research Articles, etc.)
  - Code libraries
- Software Environment
  - Database Technology: Microsoft SQL Server, ADO .Net, ODBC
  - Website Technology: Microsoft Internet Information Server (IIS), FrontPage Server Extensions
  - Development Technologies:

    MS SQL Server Tools, MS .Net Framework, MS Visual Studio .Net, MS FrontPage, C#, Visual Basic, ASP .Net, HTML, DHTML, Javascript, VBScript
- Hardware Environment
  - Web server and Database server
  - Source Code Control server (change and version control, developer coordination, code consolidation)
  - Backup and Build server (manages system archives, builds and packages the entire system)
  - Development machines (day-to-day development, unit testing, beta releases)
  - T3 Internet Connection

Some Interesting VIEWS Facts:

- Over 500 registered users
- Over 150 organizations represented
  - RPOs, EPA, State Environmental Agencies, Universities, Contractors, Stakeholders, etc.
- An estimated 250+ unique hits a day
- Over a dozen nations represented
  - Denmark, Poland, New Zealand, Australia, Zimbabwe, the U.K., and more…
- Search engine positioning (Google.com):
  - #1 for "Visibility Information"
  - #40 - #50 for "Visibility Data", up from #91 in February and rising steadily
- An ever-increasing number of feedback responses
- Linked to by over two dozen other sites (growing rapidly)
- An increasing number of requests for data and new features
  - Online submission and immediate use of data sets
  - Geographical Information System (GIS) integration
  - Online modeling tools and simulations

VIEWS

Visibility Information Exchange Web System

Home | What's New | Tour | Site Map | Contact Us | Your Account

Data
- All Data
- Metadata
- Query Wizard
- ASCII Data Files

Annual Summary
- Spatial Patterns
- Composition
- Trends
- Back Trajectories
- Summary Data
- Archived Graphics

Catalogs
- Air Quality Catalog
- Weather Catalog
- Emissions Catalog

Imagery
- Visibility Photos
- Class I Webcams
- Forest Service

Guest List

Dedicated to reducing Regional Haze in Class 1 Areas through the exchange of Data, Tools, and Ideas

The Visibility Information Exchange Web System is an online exchange of visibility data, research, and ideas designed to support the Regional Haze Rule enacted by the U.S. Environmental Protection Agency (EPA) to reduce regional haze in national parks and wilderness areas. In addition to this primary goal, VIEWS supports global efforts to better understand the affects of air pollution on visibility and to improve air quality in general.

Database | Metadata | Summary | Catalogs | Photos | Webcams

VIEWS Data Resources

The VIEWS website provides access to a wide variety of visibility data resources, including metadata from several networks of air quality monitoring sites, an integrated aerosol database, graphical summaries of data analyses, extensive catalogs of air quality information, and many others. (Mouse-over the icons above for more info.)

QUICK VISITOR'S GUIDE

- Use the top navigation bar for general information about the website.
- Use the left navigation area to browse and search for **data**.
- Click on the photographs at the very top to find out more about selected Class I Areas.
- Learn about the Regional Planning Organizations by following the **"Partners"** links.
- Click on the VIEWS logo to to download the logo in various formats and sizes.

VIEWS BULLETINS AND NEWS

All Bulletins and News

Expanded Tool !

- Online Annual Summary

PARTNERS

Western Regional Air Partnership | CENRAP | Midwest RPO | VISTAS | Regional Haze MANE-VU web site | Environmental Protection Agency

OF INTEREST

- Visibility
- About Air Pollution
- Regional Haze Rule
- Class I Areas
- IMPROVE Program
- RPO Information
- Software Tools
- Our Staff

NEWSLETTER

Signup for the VIEWS newsletter to receive bulletins and updates periodically by email:

Sign Me Up !

Please Remove Me

FEEDBACK

Recent Additions and Improvements

Improved Database Query Wizard

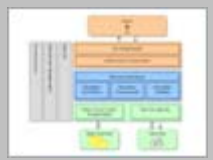
- Improved query and data retrieval performance
- Additional metadata output fields: latitude, longitude, status flags, QC flags, and more…
- Popup metadata information for monitoring sites and measurement parameters

Annual IMPROVE Data Summary

- **Contour maps** of major aerosol species for best/worst 20% and average visibility day
- **Composition** and **budgets** of the individual best/worst 20% visibility days for each monitoring site
- Aerosol and light extinction **trends**
- Air-mass histories (ATAD **Back Trajectories**)

Personalized User Accounts

- Edit user profile information
- Subscribe to the VIEWS newsletter
- Sign up for the VIEWS Guest List and User Forums (coming soon)



Expanded and Enhanced Backend Software System

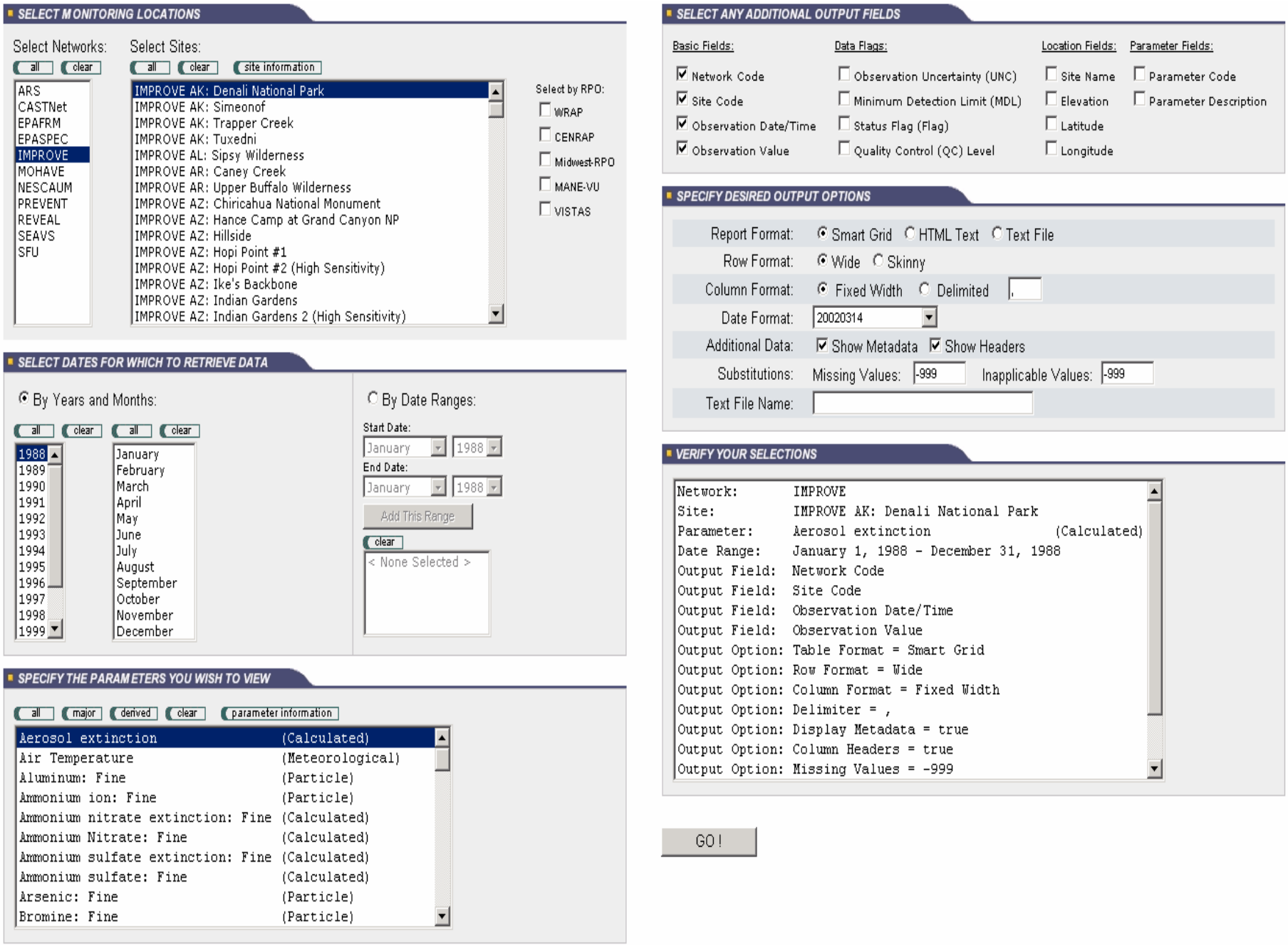
- Improved database and data warehouse architecture
- Scalable, reusable, and robust software framework
- Enhanced data ingestion system

Further Details: Database Query Wizard

- Features and Highlights
  - Site selection by network, state, RPO, and individual site
  - Parameter selection by group: major, derived, and all
  - Popup metadata information for monitoring sites and measurement parameters
  - Enhanced date range selection – by year/month groups or list of date ranges
  - Additional output fields: Latitude, Longitude, Elevation, Status and QC Flags, more…
  - Enhanced query performance
  - Choice of output formats: Smart Grid, HTML Text, and ASCII text file

- Future Plans
  - Further improve query performance
  - Provide more metadata and improve selection interfaces
  - Provide additional output formats: Excel spreadsheets, ARC/Info Shape files, etc.
  - Allow the saving and retrieval of constructed queries
  - Enhance descriptive information for networks, sites, datasets, methods, and parameters

Database Query Wizard – Query Construction Interface



Database Query Wizard – Example Query Results (Smart Grid, Wide format)

- Guide to interpreting query results (Click the plus/minus sign to show/hide the Guide)
  - Important Notice
  - Locations
  - Parameters
  - Location History
  - Network History
  - Status Flags
  - Quality Control Level Descriptions

Location	Date	Latitude	Longitude	caf:Obs_Value	cm:Obs_Value	fef:Obs_Value	frhgrid:Obs_Value	hf:Obs_Value	kf:Obs_Value	mt:Obs_Value	no3f:Obs_Value	sf:Obs_Value	sif:Obs_Value	tif:Obs_V
BIBE1	01/01/2000	29.3027	-103.178	0.09892	4.899001	0.0335	2	0.09977	0.0287	7.832701	0.0344	0.16553	0.14945	0.00253
BIBE1	01/05/2000	29.3027	-103.178	0.27048	12.8851	0.12541	2	0.10593	0.09261	18.1024	0.1478	0.19263	0.50879	0.008420
BIBE1	01/08/2000	29.3027	-103.178	0.10174	10.3271	0.06039	2	0.21154	0.07187001	16.7888	0.3826	0.51051	0.26009	0.00617
BIBE1	01/12/2000	29.3027	-103.178	0.10178	3.7669	0.03051	2	0.08818001	0.03824	6.3534	0.0313	0.16962	0.15761	0.00321
BIBE1	01/15/2000	29.3027	-103.178	0.06418	3.8654	0.02908	2	0.27556	0.04751	10.195	0.1971	0.81227	0.08655	0.00575
BIBE1	01/19/2000	29.3027	-103.178	0.08167	5.1193	0.03306	2	0.12643	0.02869	8.0128	0.07530001	0.36479	0.10268	0.0031
BIBE1	01/22/2000	29.3027	-103.178	0.11095	4.7986	0.04788001	2	0.15215	0.05182	9.1846	0.09450001	0.41148	0.19294	0.00412
BIBE1	01/26/2000	29.3027	-103.178	0.21413	13.2793	0.06892	2	0.27562	0.07655001	21.2418	0.2687	0.6911801	0.23255	0.00591
BIBE1	01/29/2000	29.3027	-103.178	0.02651	1.403601	0.0162	2	0.29254	0.02471	7.802701	0.2448	0.7828901	0.05299	0.0069
BIBE1	02/02/2000	29.3027	-103.178	0.00932	1.2314	0.00454	1.86	0.14993	0.01665	4.1667	0.3386	0.27081	0.02121	0.00462
BIBE1	02/05/2000	29.3027	-103.178	0.0323	2.4886	0.01712	1.86	0.1271	0.01528	5.6029	0.1403	0.28362	0.0487	0.0028
BIBE1	02/09/2000	29.3027	-103.178	0.12604	7.9557	0.06245	1.86	0.27821	0.06332	15.0463	0.1966	0.66234	0.20339	0.0059
BIBE1	02/12/2000	29.3027	-103.178	0.12536	5.6839	0.05743	1.86	0.11322	0.05103	8.9391	0.0473	0.12898	0.27262	0.00538
BIBE1	02/16/2000	29.3027	-103.178	0.10469	8.3993	0.04292	1.86	0.28579	0.05126	15.2006	0.169	0.8043801	0.1908	0.0085
BIBE1	02/19/2000	29.3027	-103.178	0.12775	6.7375	0.05485	1.86	0.27953	0.05204	14.0399	0.337	0.615	0.20901	0.005280
BIBE1	02/23/2000	29.3027	-103.178	0.085	4.428601	0.05282	1.86	0.07473001	0.03255	6.864601	0.07480001	0.08641001	0.23769	0.0054
BIBE1	02/26/2000	29.3027	-103.178	0.12702	12.9484	0.08786	1.86	0.09394	0.05890001	17.166	0.1972	0.12551	0.38522	0.00994
BIBE1	03/01/2000	29.3027	-103.178	0.21184	17.4148	0.10795	1.61	0.33104	0.10613	27.3043	0.4184	1.11068	0.50099	0.00799
BIBE1	03/04/2000	29.3027	-103.178	0.13842	12.9379	0.04194	1.61	0.15182	0.03776	16.572	0.1048	0.30539	0.20133	0.00404
BIBE1	03/08/2000	29.3027	-103.178	0.24137	8.6289	0.12555	1.61	0.10123	0.08265001	13.0208	0.0598	0.11487	0.6404501	0.01094
BIBE1	03/11/2000	29.3027	-103.178	0.22875	13.4456	0.17357	1.61	0.20923	0.10947	21.149	0.1623	0.38407	0.84668	0.01211
BIBE1	03/15/2000	29.3027	-103.178	0.12507	3.097	0.05896	1.61	0.15059	0.04801	7.2637	0.1086	0.34017	0.28386	0.006190
BIBE1	03/18/2000	29.3027	-103.178	0.4833	14.4601	0.23667	1.61	0.1836	0.1526	23.7332	0.2222	0.34467	1.17503	0.01889
BIBE1	03/22/2000	29.3027	-103.178	1.3073	44.2285	0.44575	1.61	0.25447	0.32645	62.0211	0.306	0.29653	2.6635	0.03359
BIBE1	03/25/2000	29.3027	-103.178	0.16113	7.0757	0.06803	1.61	0.38832	0.10612	17.2414	0.4644	1.20448	0.33161	0.00817
BIBE1	03/29/2000	29.3027	-103.178	0.18221	0.708499	0.11347	1.61	0.1286	0.07794001	10.049	0.0925	0.15101	0.51543	0.01113
BIBE1	04/01/2000	29.3027	-103.178	0.12945	9.0901	0.06674	1.52	0.3856	0.07824	19.121	0.3913	1.22164	0.31596	0.007530
BIBE1	04/05/2000	29.3027	-103.178	0.28879	8.051701	0.12965	1.52	0.19937	0.07675	13.9736	0.116	0.39318	0.51222	0.00849
BIBE1	04/08/2000	29.3027	-103.178	0.32702	19.1123	0.26684	1.52	0.23944	0.18406	29.8446	0.1124	0.25443	1.40653	0.02455
BIBE1	04/12/2000	29.3027	-103.178				1.52							

Database Query Wizard – Example Query Results (HTML Text, Skinny format)

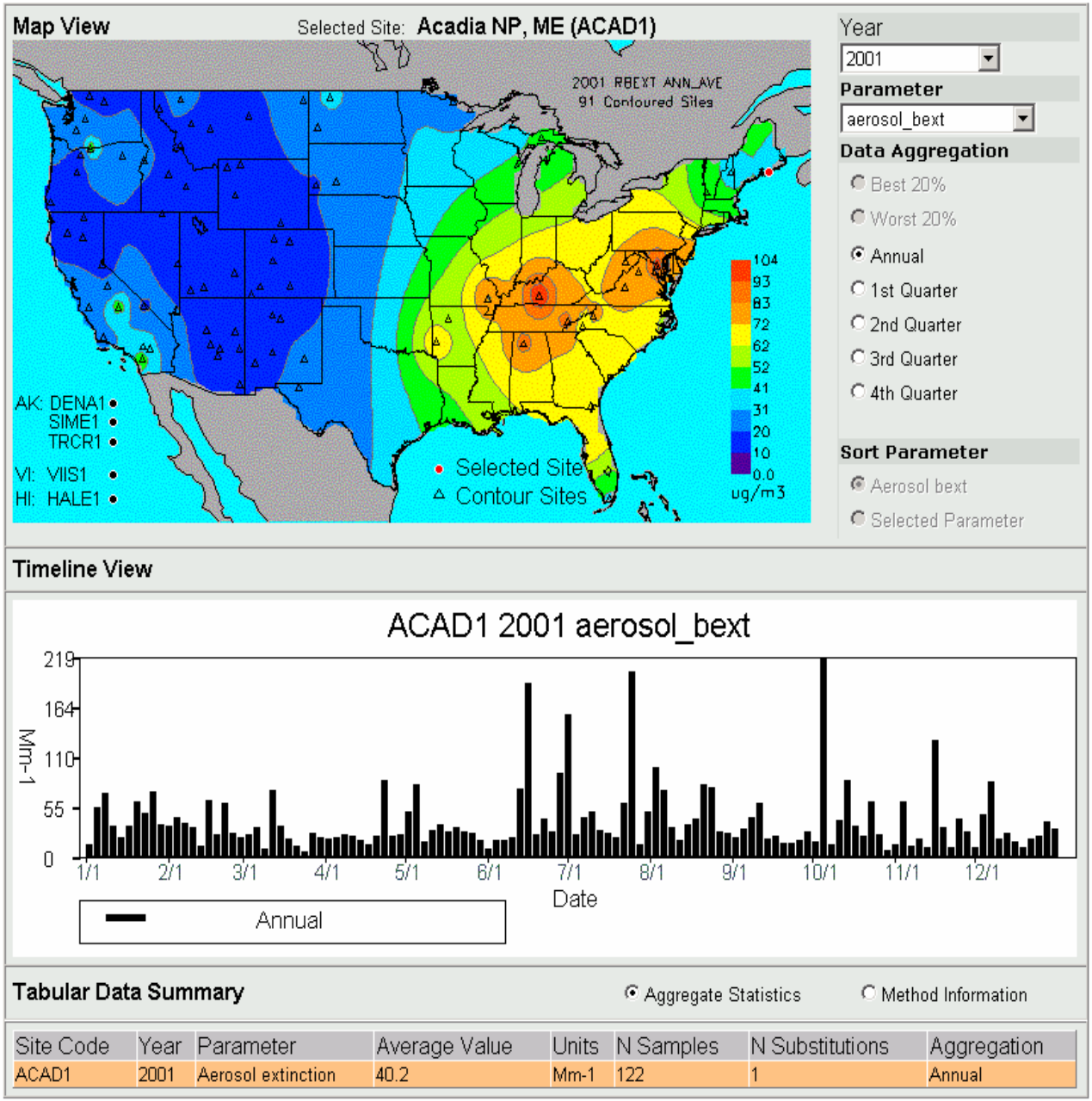
Network	Location	Date	Elevation	Latitude	Longitude	Parameter	Obs_Value	UNC	MDL	Flag
IMPROVE	BIBE1	20000101	1075	29.3027	-103.178	ALf	0.04116	0.00347	0.00264	NM
IMPROVE	BIBE1	20000101	1075	29.3027	-103.178	CAf	0.09892	0.00535	0.0009900001	NM
IMPROVE	BIBE1	20000101	1075	29.3027	-103.178	CM	4.899001	-999	-999	DE
IMPROVE	BIBE1	20000101	1075	29.3027	-103.178	FEf	0.0335	0.00183	0.00015	NM
IMPROVE	BIBE1	20000101	1075	29.3027	-103.178	fRHgrid	1.79	-999	-999	DE
IMPROVE	BIBE1	20000101	1075	29.3027	-103.178	Hf	0.09977	0.00558	0.00216	NM
IMPROVE	BIBE1	20000101	1075	29.3027	-103.178	Kf	0.0287	0.00186	0.00128	NM
IMPROVE	BIBE1	20000101	1075	29.3027	-103.178	MT	7.832701	0.4671	0.8075001	NM
IMPROVE	BIBE1	20000101	1075	29.3027	-103.178	NO3f	0.0344	0.0105	0.0207	NM
IMPROVE	BIBE1	20000101	1075	29.3027	-103.178	Sf	0.16553	0.00882	0.00184	NM
IMPROVE	BIBE1	20000101	1075	29.3027	-103.178	SIf	0.14945	0.00819	0.00208	NM
IMPROVE	BIBE1	20000101	1075	29.3027	-103.178	TIf	0.00253	0.00053	0.0009700001	NM
IMPROVE	BIBE1	20000105	1075	29.3027	-103.178	ALf	0.19499	0.01264	0.00381	NM
IMPROVE	BIBE1	20000105	1075	29.3027	-103.178	CAf	0.27048	0.01434	0.00137	NM
IMPROVE	BIBE1	20000105	1075	29.3027	-103.178	CM	12.8851	-999	-999	DE
IMPROVE	BIBE1	20000105	1075	29.3027	-103.178	FEf	0.12541	0.006510001	0.0002	NM
IMPROVE	BIBE1	20000105	1075	29.3027	-103.178	fRHgrid	1.79	-999	-999	DE
IMPROVE	BIBE1	20000105	1075	29.3027	-103.178	Hf	0.10593	0.00617	0.00269	NM
IMPROVE	BIBE1	20000105	1075	29.3027	-103.178	Kf	0.09261	0.00522	0.00178	NM
IMPROVE	BIBE1	20000105	1075	29.3027	-103.178	MT	18.1024	0.6687	0.7803	NM
IMPROVE	BIBE1	20000105	1075	29.3027	-103.178	NO3f	0.1478	0.0123	0.0203	NM
IMPROVE	BIBE1	20000105	1075	29.3027	-103.178	Sf	0.19263	0.01044	0.00261	NM
IMPROVE	BIBE1	20000105	1075	29.3027	-103.178	SIf	0.50879	0.02662	0.00297	NM
IMPROVE	BIBE1	20000105	1075	29.3027	-103.178	TIf	0.008420001	0.0008800001	0.00131	NM
IMPROVE	BIBE1	20000108	1075	29.3027	-103.178	ALf	0.09725001	0.007900001	0.00343	NM
IMPROVE	BIBE1	20000108	1075	29.3027	-103.178	CAf	0.10174	0.00581	0.00121	NM
IMPROVE	BIBE1	20000108	1075	29.3027	-103.178	CM	10.3271	-999	-999	DE
IMPROVE	BIBE1	20000108	1075	29.3027	-103.178	FEf	0.06039	0.0032	0.00017	NM
IMPROVE	BIBE1	20000108	1075	29.3027	-103.178	fRHgrid	1.79	-999	-999	DE
IMPROVE	BIBE1	20000108	1075	29.3027	-103.178	Hf	0.21154	0.01129	0.00254	NM
IMPROVE	BIBE1	20000108	1075	29.3027	-103.178	Kf	0.07187001	0.00407	0.00157	NM
IMPROVE	BIBE1	20000108	1075	29.3027	-103.178	MT	16.7888	0.6319001	0.7631	NM
IMPROVE	BIBE1	20000108	1075	29.3027	-103.178	NO3f	0.3826	0.0196	0.02	NM
IMPROVE	BIBE1	20000108	1075	29.3027	-103.178	Sf	0.51051	0.0262	0.00237	NM
IMPROVE	BIBE1	20000108	1075	29.3027	-103.178	SIf	0.26009	0.0142	0.00267	NM
IMPROVE	BIBE1	20000108	1075	29.3027	-103.178	TIf	0.00617	0.00083	0.00116	NM
IMPROVE	BIBE1	20000112	1075	29.3027	-103.178	ALf	0.04165	0.00342	0.00285	NM
IMPROVE	BIBE1	20000112	1075	29.3027	-103.178	CAf	0.10178	0.00556	0.00106	NM
IMPROVE	BIBE1	20000112	1075	29.3027	-103.178	CM	3.7669	-999	-999	DE
IMPROVE	BIBE1	20000112	1075	29.3027	-103.178	FEf	0.03051	0.00174	0.00016	NM

Further Details: Annual Data Summary

- Features and Highlights
  - Contour maps of spatial and seasonal aerosol patterns
  - Aerosol and light extinction budgets
  - Composition of the individual best/worst 20% visibility days for each monitoring site
  - Aerosol and light extinction trends
  - Air-mass histories (ATAD Back Trajectories)
  - Color-coded bar charts, pie charts, and line graphs
  - An expanded selection of averaging and aggregation analyses
  - Expanded help and descriptive information
  - Improved interface and query performance

- Future Plans
  - Improve the user interface and extend graphical tools
  - Expand metadata information: Sites, Parameters, Calculation/Aggregation Methods, etc.
  - Provide "report construction" capabilities: user selects graphical components and content
  - Provide export options: MS Word, MS PowerPoint, etc.
  - Integrate GIS capabilities

Annual Summary - Spatial and Seasonal Patterns



Site Code	Year	Parameter	Average Value	Units	N Samples	N Substitutions	Aggregation
ACAD1	2001	Aerosol extinction	40.2	Mm-1	122	1	Annual

Data Views:

Map View

This view displays contours of the selected parameter for a selected year and aggregation. Data aggregation options include the average of the annual, quarter, and best or worst 20% of sampled days. The best and worst 20% days in a year can be chosen by using chemical extinction (aerosol_bext) or the selected parameter as a sort variable. Selecting a site icon from the map populates the **timeline view** with data for that site.

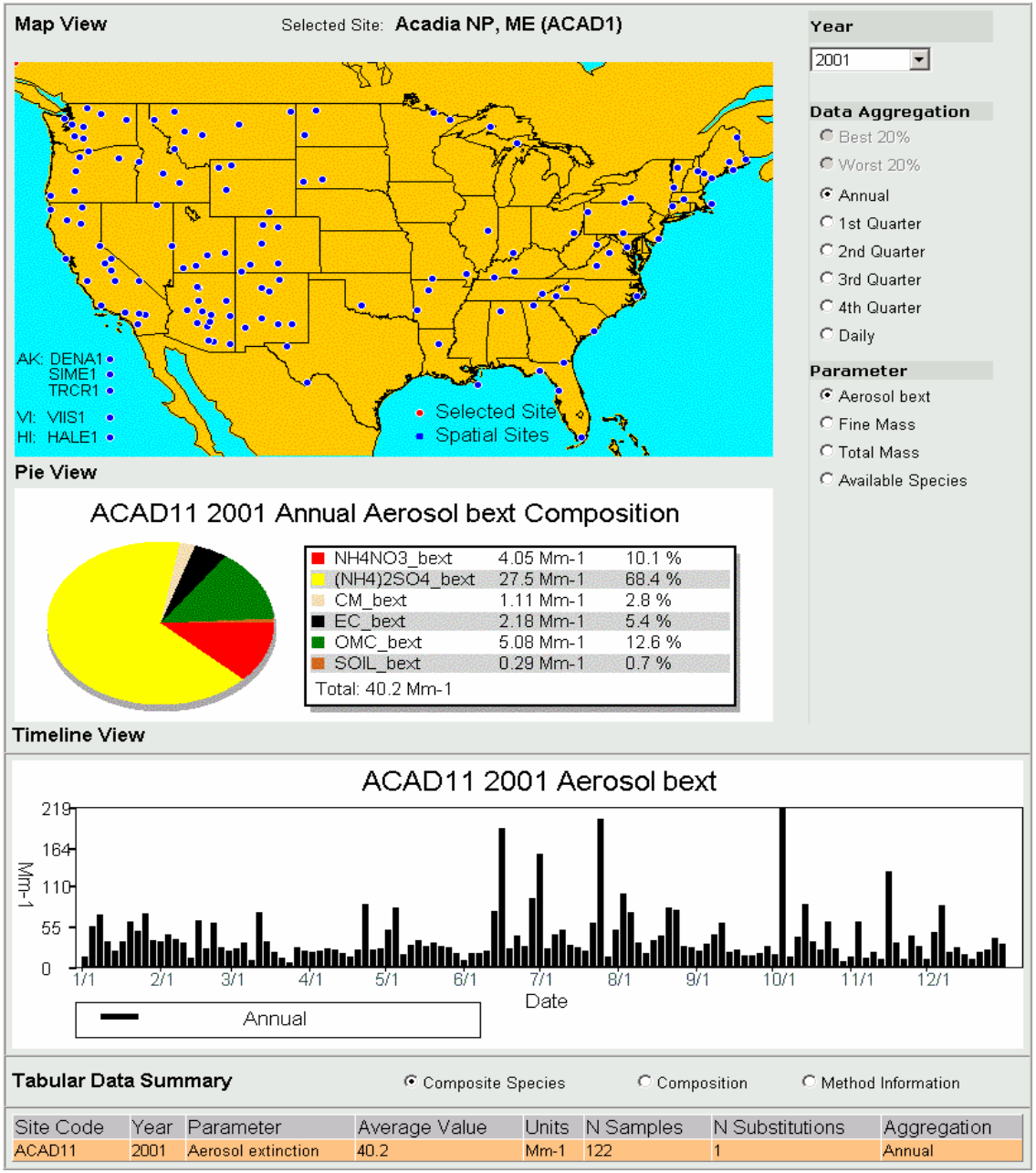
Timeline View

This view shows daily values for the selected site and parameter. Sampling days in the chosen data aggregation are highlighted. Either chemical extinction or the selected parameter can be used as a sort variable for the best or worst 20% days. Grayed-out selections are not currently available.

Tabular Data Summary

This view shows method information or data statistics for the selected monitoring site. When viewing data statistics, 'N samples' is the number of samples in the data aggregation and 'N substitutions' is the number of values substituted using guidelines outlined in the RHR tracking progress document.

Annual Summary - Composition



Data Views:

Map View

This view displays IMPROVE aerosol monitoring sites for the selected year. Click on a site icon to populate other views with data from that site.

Pie Chart View

This view shows the average species' composition for the selected parameter and data aggregation. Data aggregation options are average of the annual, seasonal, best or worst 20% aerosol extinction days.

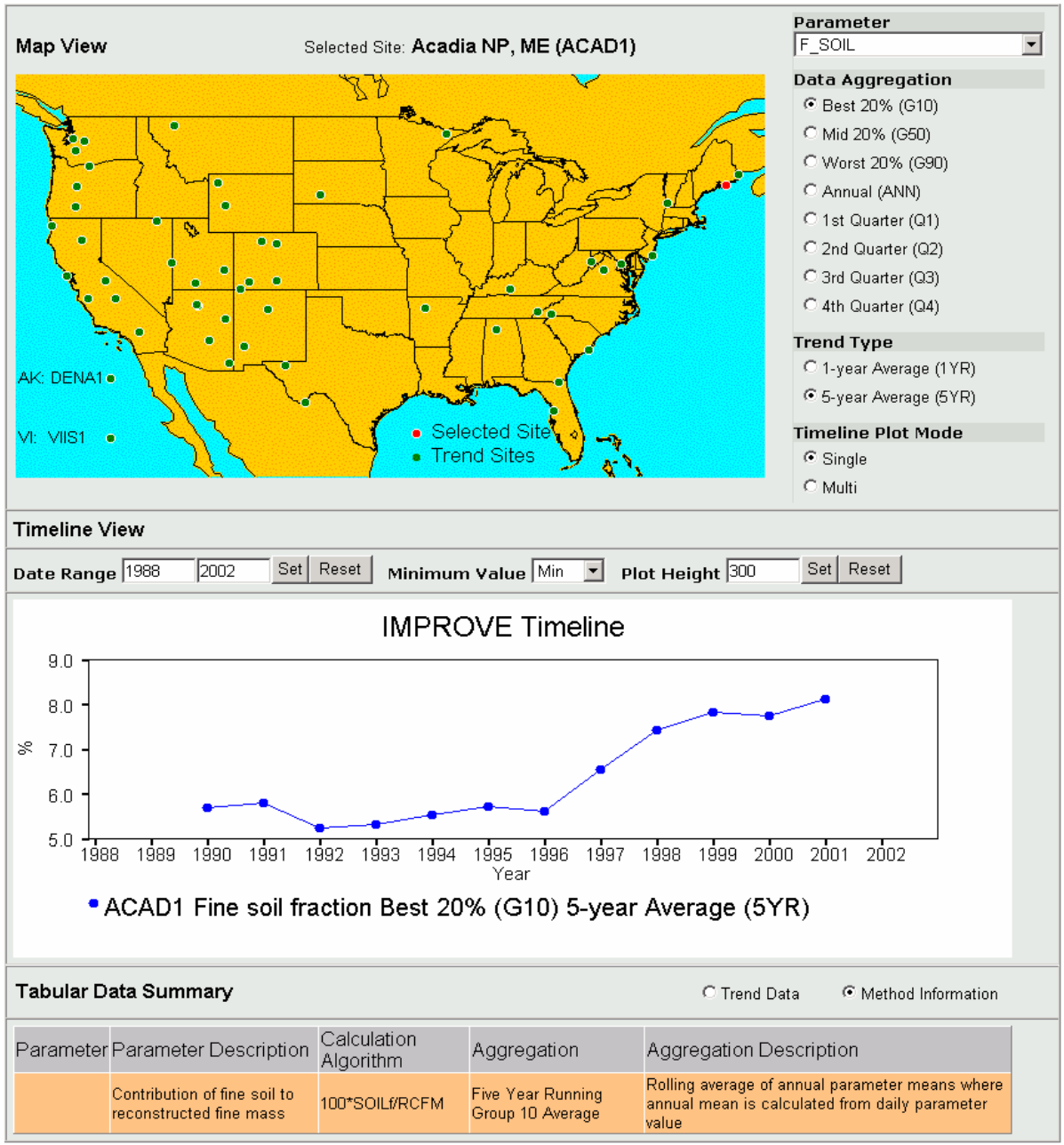
Timeline View

This view displays the daily sample values for the selected site, year, and parameter. Selected data aggregations are highlighted. Selecting an individual sample day from the timeline updates pie view with the selected parameter composition for that day. Grayed-out selections are not currently available.

Tabular Data Summary

This view shows calculation method information for the selected parameter.

Annual Summary - Trends



Parameter	Parameter Description	Calculation Algorithm	Aggregation	Aggregation Description
	Contribution of fine soil to reconstructed fine mass	100*SOILf/RCFM	Five Year Running Group 10 Average	Rolling average of annual parameter means where annual mean is calculated from daily parameter value

Data Views:

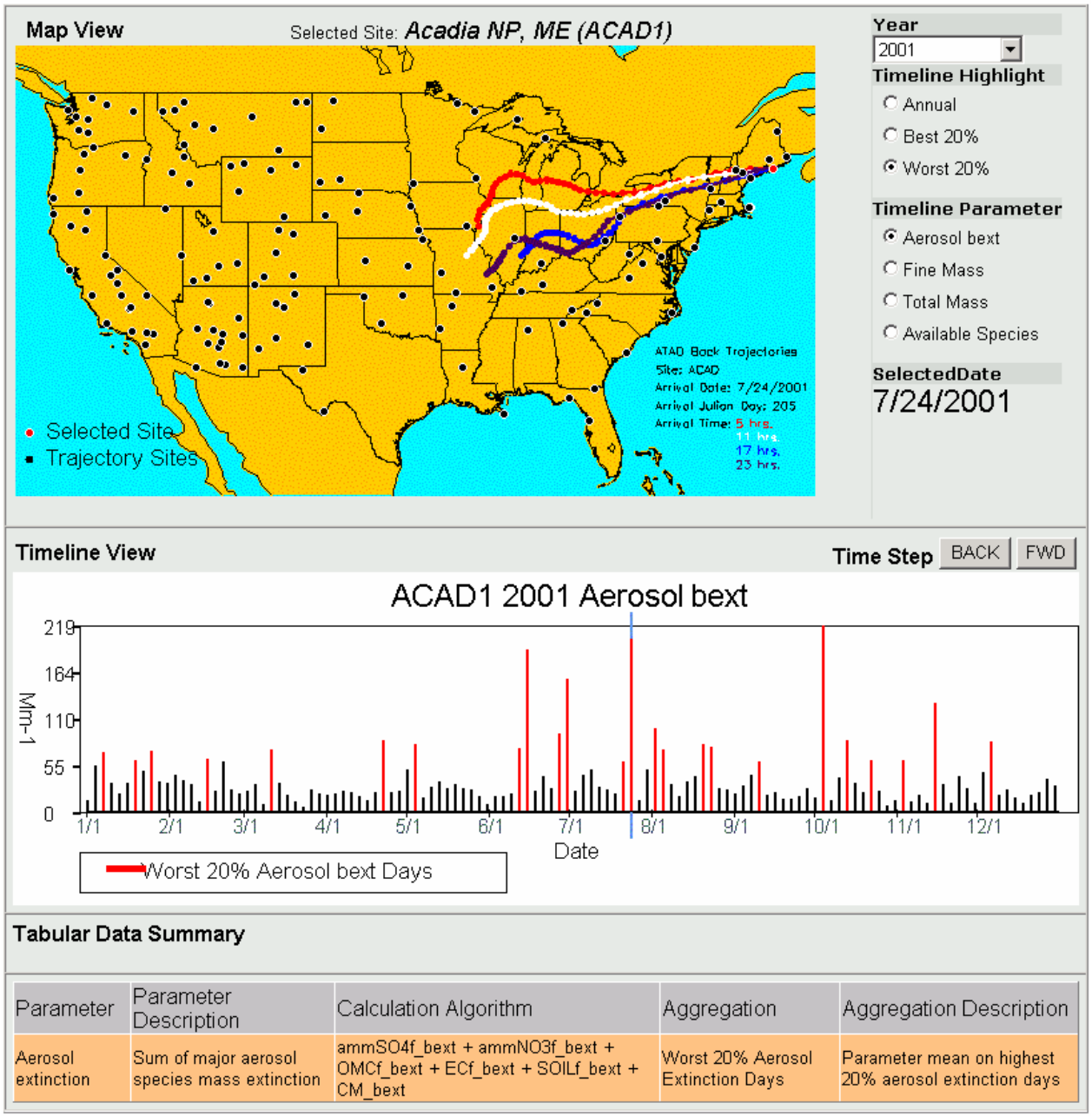
Map View

This view displays IMPROVE monitoring sites with sufficient data for trend analysis. Click on a map icon to select trend data for that site.

Timeline View

Data for a selected parameter and data aggregation. Timeline data can be selected by parameter, data aggregation, and type of trend (either annual or 5-year rolling average). The Timeline has two modes, 'Single' and 'Multi'. In Single mode the timeline will display your most recent selection. In Multi mode each additional selection adds another timeline to the display. Up to 6 timelines can be superimposed in 'Multi' mode. Attributes of the timeline plot such as the date, value range, and plot height can be adjusted. To remove multiple plots from the view, select 'Single' mode and your most recent selection is displayed. Parameters must have the same units to be superimposed in 'Multi' mode. If the timeline does not update based on your last selection there may not be data available for the selected parameter or aggregation. Grayed-out selections are not currently available.

Annual Summary – Back Trajectories



Parameter	Parameter Description	Calculation Algorithm	Aggregation	Aggregation Description
Aerosol extinction	Sum of major aerosol species mass extinction	ammSO4f_bext + ammNO3f_bext + OMCf_bext + ECf_bext + SOILf_bext + CM_bext	Worst 20% Aerosol Extinction Days	Parameter mean on highest 20% aerosol extinction days

Data Views:

Map View

This view displays back trajectories from the Atmospheric Transport and Deposition (ATAD) model. Click on a site icon to view trajectories ending at that site. Up to four trajectories are displayed for each day at six hour intervals. Each plot symbol on a trajectory indicates an air parcel position three hours older than the next parcel along the trajectory line to the site. Complete trajectories go back 5-days.

Timeline View

This view shows IMPROVE parameter values for the selected year. The best and worst 20% days can be highlighted to help associate any of these individual sampling days with air mass source regions for that day. Click on a daily value from the timeline to display that days' trajectory, or use the BACK and FWD buttons to move to the next or previous days' trajectory. Trajectories are available for all days in the calendar year.

Tabular Data Summary

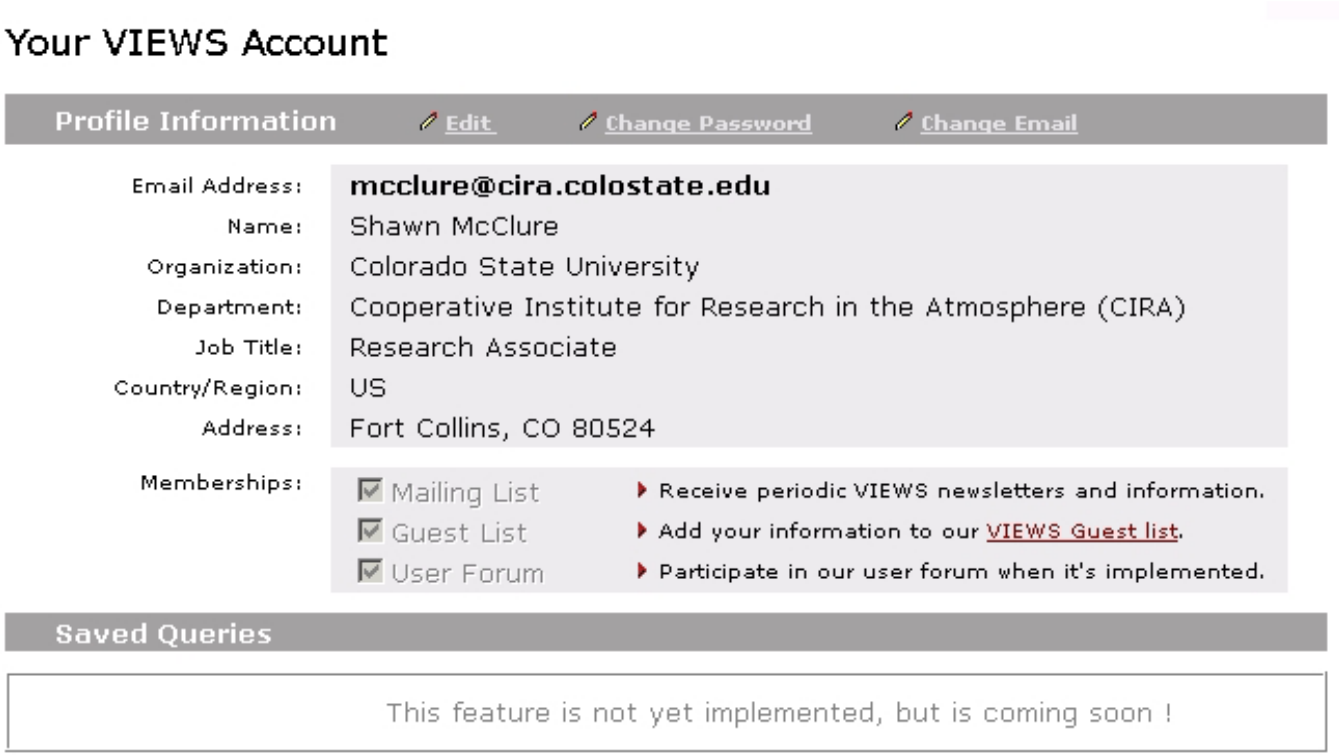
This view shows calculation method information for the selected parameter.

Further Details: User Accounts

- Features and Highlights
  - Create and edit user profile information
  - Subscribe to the periodic VIEWS newsletter
  - Sign up for inclusion in the online VIEWS Guest List

- Future Plans
  - Save and organize data queries, query results, and other products
  - Choose to participate in and contribute to VIEWS User Forums

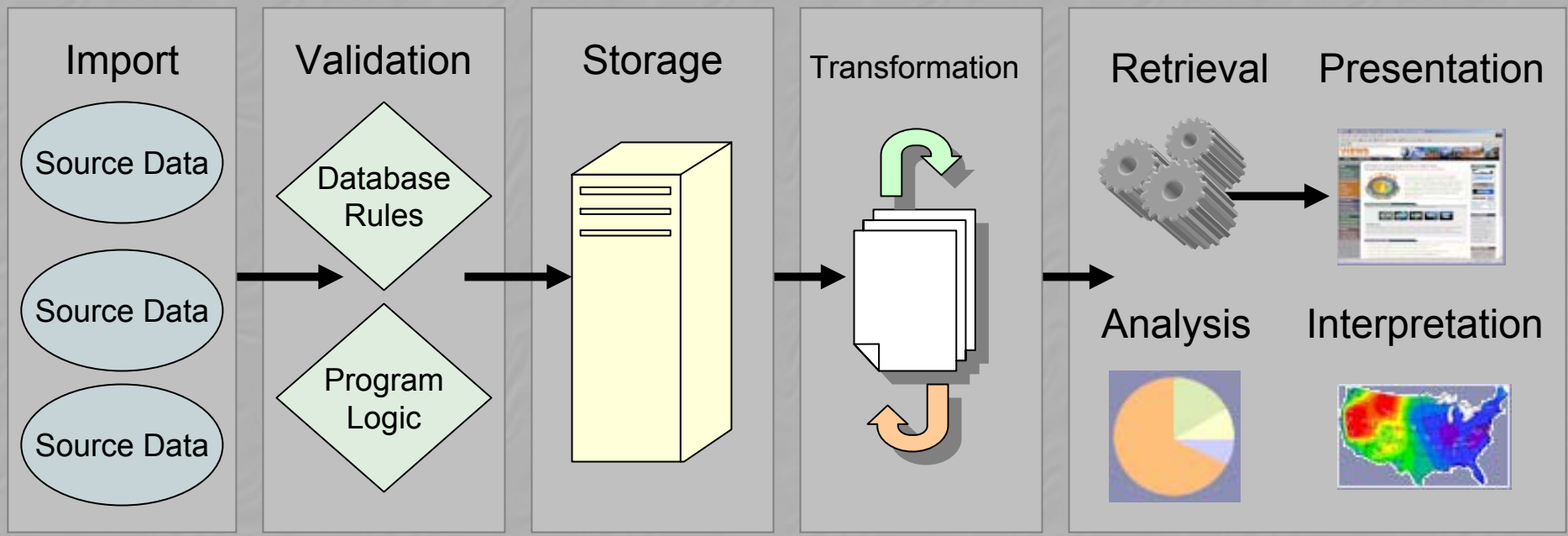
Personalized User Accounts



Features:

- Edit user profile information
- Subscribe to VIEWS newsletter
- Signup for VIEWS Guest List
- Signup for VIEWS User Forum

The lifecycle of data in VIEWS...



Import: Getting the data into the system

Validation: Ensuring data accuracy

Storage: Managing the data, backup, archival

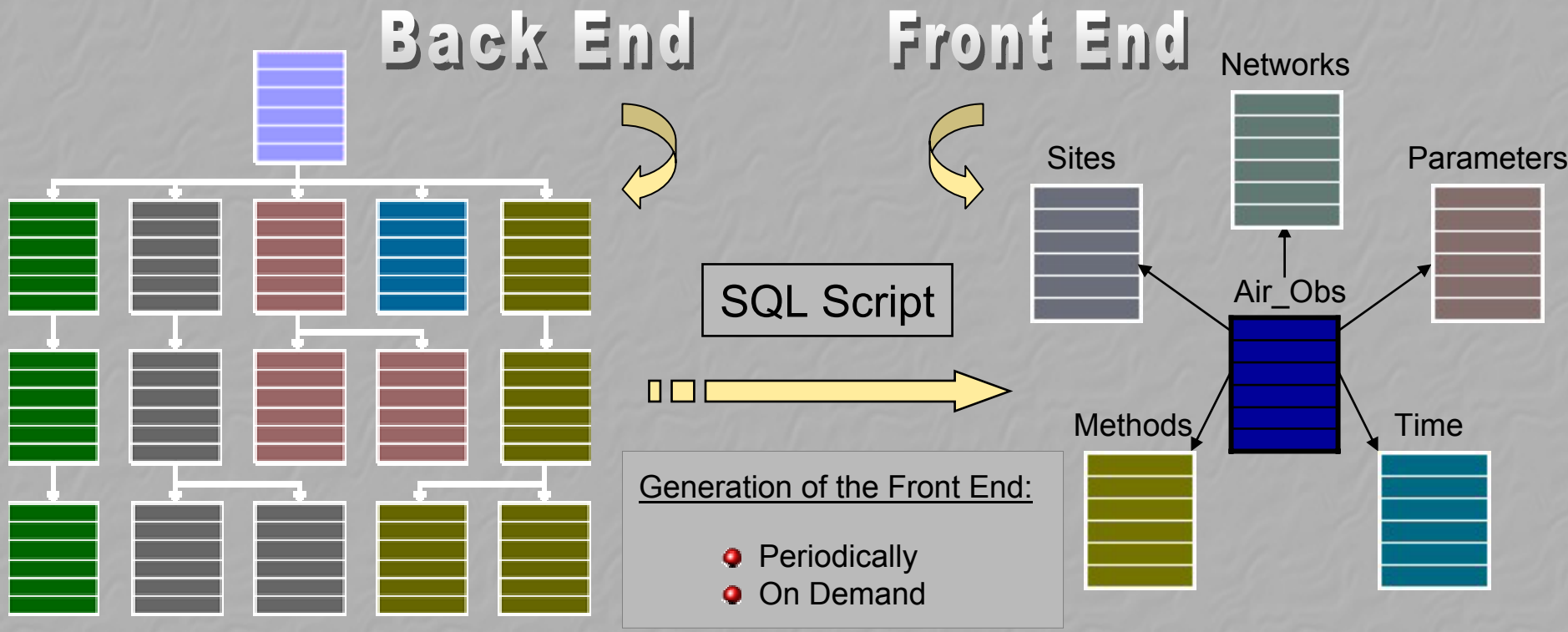
Transformation: Sorting, joining, aggregating

Retrieval: Getting the data out

Presentation: Displaying the data

Analysis: Making the data understandable

Interpretation: Making the data usable



The front-end **DSS** is automatically generated by the back-end **OLTP**

- Map Projection Analogy: Base system (globe) and derived views (projections)
- Optimization: Allows each architecture to do what it does best without compromise
- Data Transparency: User doesn't need to know how data is stored, only how to use it
- Exchangeability: A wide variety of diverse schemas can be generated from OLTP

VIEWS Data Inventory

Data Sets currently available from VIEWS:

ARS	nephelometer, transmissometer
CASTNET	drychem, vischem
EPA AIRS FRM	frm data
EPA AIRS Speciation	speciation data
IMPROVE	aerosol, calculated variables, regional haze rule data
MOHAVE	aerosol
PREVENT	aerosol
REVEAL	aerosol
SEAVS	aerosol

Data Sets soon to be added to VIEWS:

SFU	aerosol
NESCAUM	aerosol
MOHAVE	nephelometer, transmissometer
SEAVS	nephelometer, transmissometer
BRAVO	aerosol, nephelometer, transmissometer

Planned Data Acquisitions

SEARCH Continuous	PM2.5, speciated aerosol, gaseous, surface met
SEARCH 24hr	PM2.5, speciated aerosol
NPS	gaseous
EPA AIRS	PM10
GAViM	PM2.5, speciated aerosol
NEPART	PM2.5, speciatPM2.5, speciated aerosoled aerosol
Trans-Boundary Monitoring Network (TBDM)	PM10, PM2.5, SO2, NOx, meteorology
Surface Meteorology	meteorology and visual range
EPA AIRS Gaseous	O3, CO, SO2, NO2
NAPS	PM2.5, speciated aerosol
NADP/NTN	Wet deposition ions
UV Radiation	
EPA Supersites	aerosol, gaseous, met, SO2, NOX, PM10, VOC, CO
AIRS Emissions	
Modeling Data and Output(?)	
Other Emissions	

Future Directions: Data Acquisition

- Optimize data storage and retrieval mechanisms
- Further refine and automate data ingestion and transformation tools
- Identify and acquire additional data sets
  - Special studies and projects
  - University programs and research
  - International data sets
  - Modeling data and output results (?)
- Allow online submission of data sets – per standardized format
  - Directory Interchange Format (DIF) – from NASA's GCMD
  - NARSTO's Data Exchange Template
- Implement an easily searchable catalog of offsite data resources
  - ISO 11179: Specification and Standardization of Data Elements
  - Dublin Core standard by Online Computer Library Center (OCLC)
- Develop and emphasize the "Exchange" nature of VIEWS

Future Directions: Data Management & Retrieval

- Extend and homogenize metadata, improve metadata search options
- Allow ad hoc SQL queries and refine query construction tools
- Develop extensive Online Analytical Processing (OLAP) capabilities
  - Online, interactive cube construction
  - Simplified OLAP query interfaces
  - Extensive analytical tools and output options
- Offer direct access to data sets not yet incorporated into the Integrated Database
  - Directory Interchange Format (DIF) – from NASA's GCMD
  - NARSTO's Data Exchange Template
- Implement additional data output formats
  - Microsoft Excel spreadsheets
  - ARC\Info Shape files
  - Model-ready input files
  - Direct database conversions and output dumps: MS Access, Oracle, FoxPro, etc.
- Provide XML Web Services for data access and retrieval

Future Directions: Data Presentation

- Enhance mapping features and integrate additional GIS capabilities
  - isopleth and contour maps
  - scatter plots
  - stacked bar charts
  - gridded data
  - statistical analysis tools
  - presentation-ready reports and maps
- Provide interactive report construction and formatting tools
- Allow saving and retrieval of constructed reports and maps
- Provide visibility and air quality-related map services
- Incorporate CAPITA's DVOY trajectory and residence time browser
- Implement sorting and searching features for metadata and query results
- Provide an extensive catalog of internet and document resources
- Provide an online tutorial for VIEWS website and tools, analysis methods
- Provide training materials and services

Ongoing Issues...

- Integrating new data acquisitions into the Integrated Database
- Identifying and implementing useful metadata and data standards
- Developing and enhancing online tools at a regular and frequent rate
- Keeping pace with a diverse and rapidly expanding user community
- Maintaining and improving data retrieval performance
- Making efficient and prioritized use of available funding and resources

Conclusion and call for participation…

- Visit our website: http://vista.cira.colostate.edu/views
- Sign up for our newsletter
- Become a member of our guest list
- Access our data, use our tools, and check back frequently…
- Give us your comments, suggestions, and feedback (***Really!!*** …and often.)

Thank You.

http://vista.cira.colostate.edu/views